CHEMICAL ANALYSIS OF ORE TAILINGS REFERENCE MATERIALS

FINAL REPORT

BY

CHEMEX LABS LIMITED

Work on this project was conducted under the auspices of the
Department of Energy, Mines and Resources

DSS FILE NUMBER: 09SQ.23440-7-9166-9

DSS CONTRACT NUMBER: 23440-7-9166/09-SQ

SCIENTIFIC AUTHORITY: Dr. C.W. Smith

6 pp

MICROMEDIA

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Analytical Chemists * Geochemists * Registered Assayers
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PHONE (416) 890-0310

To: CANMET
CCRMP
555 BOOTH STREET
OTTAWA, ONTARIO
K1A 0G1

A8810058

Comments: ATTN: CLINTON SMITH

CERTIFICATE A8810058

CANMET
PROJECT : 23440-7-9166-9
P O # :

Samples submitted to our lab in Vancouver, BC.
This report was printed on 31-MAR-88.

SAMPLE PREPARATION

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION
214	24	Received sample as pulp
227	24	Rolling charge
232	24	Total ICP digestion

ANALYTICAL PROCEDURES

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION	METHOD	DETECTION LIMIT	UPPER LIMIT
592	24	SiO2 %: Whole rock	ICP-AES	0.01	99.00
594	24	Al2O3 %: Whole rock	ICP-AES	0.01	99.00
586	24	Fe2O3(total) %: Whole rock	ICP-AES	0.01	99.00
593	24	MgO %: Whole rock	ICP-AES	0.01	99.00
588	24	CaO %: Whole rock	ICP-AES	0.01	99.00
599	24	Na2O %: Whole rock	ICP-AES	0.01	99.00
821	24	K2O %: Whole rock	ICP-AES	0.01	99.0
595	24	TiO2 %: Whole rock	ICP-AES	0.01	99.00
597	24	P2O5 %: Whole rock	ICP-AES	0.01	99.00
596	24	MnO %: Whole rock	ICP-AES	0.01	99.00
542	24	BaO %: Whole rock	ICP-AES	0.01	99.00
475	24	L.O.I. %: Loss on ignition	FURNACE	0.01	99.00
540	24	Total %	CALCULATION	0.01	N/A
368	18	CO2 %: Inorganic	LECO-GASOMETRIC	0.20	100.0
379	24	S %: HNO3-bromide digestion	GRAVIMETRIC	0.01	100.00
466	24	SO4 %: Acid or H2O leach	GRAVIMETRIC	0.01	100.00
443	22	Moisture %: Dry to constant wt	FURNACE	0.01	100.00

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SAMPLE PREPARATION

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION
299	24	Sample split from other certif

ANALYTICAL PROCEDURES

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION	METHOD	DETECTION LIMIT	UPPER LIMIT
2	24	Cu ppm: HNO3-aqua regia digest	AAS	1	10000
4	24	Pb ppm: HNO3-aqua regia digest	AAS-BKGD CORR	1	10000
5	24	Zn ppm: HNO3-aqua regia digest	AAS	1	10000
7	24	Cd ppm: HNO3-aqua regia digest	AAS-BKGD CORR	0.1	200
8	24	Ni ppm: HNO3-aqua regia digest	AAS-BKGD CORR	1	10000
9	24	Co ppm: HNO3-aqua regia digest	AAS-BKGD CORR	1	10000
13	24	As ppm: HNO3-aqua regia digest	AAS-HYDRIDE/EDL	1	10000
975	24	Au ppb: ICP-fluorescence package	FA-ICP-AFS	2	10000
977	24	Pd ppb: ICP-fluorescence package	FA-ICP-AFS	2	10000
976	24	Pt ppb: ICP-Fluorescence package	FA-ICP-AFS	5	10000

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OUTLINE OF METHODS USED FOR DSS CONTRACT 23440-7-9166-9

The samples were received, mixed and analysed under the supervision of Mr. B. L. Twaites, Chief Assayer. The contents of each bottle were rolled 100 times on plastic sheeting before subsampling.

Group 1

Major elements were analysed by lithium metaborate fusion followed by inductively coupled plasma spectrometry for:

SiO2, tot. Fe as Fe2O3, CaO, MgO, Al2O3, TiO2, K2O, Na2O, P2O5

MnO,

LOI - is a gravimetric determination of weight loss on ingntion of the sample at 850 deg C. for 2 hours.

Total is an arithmetic sum of the above constituents

Group 2

Total Sulphur by Leco combustion;

sulphate - acid leach to liberate sulphate then total sulphur on the residue by combustion, difference between total sulphur before and after treatment is sulphate;

carbonate by acid generation in a closed system followed by quantification in a gas burette;

moisture at 105 deg C by gravimetic determination.

Group 3 and 4

A sample is digested in hot nitric/perchloric acid and analysed by conventional atomic absorption spectrometry(AAS) for copper, lead, zinc, cadmium, nickel and cobalt. Arsenic is analysed by flameless hydride AAS.

Group 5

A 20 gram sample is fire assayed by conventional lead collection fire assay procedures. The resulting dore bead is dissolved in hot aqua regia and the solution analysed by Atomic Fluorescence Spectrometry.

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Page No. : 1-A
Tot. Pages: 1
Date : 31-MAR-88
Invoice # : I-8810058
P.O. # :

CERTIFICATE OF ANALYSIS A8810058

SAMPLE DESCRIPTION	PREP CODE	SiO2 %	Al2O3 %	Fe2O3 %	MgO %	CaO %	Na2O %	K2O %	TiO2 %	P2O5 %	MnO %	BaO %	LOI %	TOTAL %	CO2 % inorg	S %	SO4 %	Moistur %
KTS-1 A	214 227	40.18	8.04	27.64	4.22	3.81	0.76	0.65	0.64	0.16	0.25	0.01	7.51	93.88	< 0.20	1.75	3.91	2.24
KTS-1 B	214 227	40.36	8.09	27.89	4.27	3.82	0.77	0.66	0.64	0.15	0.25	0.01	7.70	94.62	< 0.20	1.70	3.85	2.27
KTS-1 C	214 227	40.72	8.20	27.62	4.30	3.89	0.80	0.62	0.64	0.16	0.25	0.01	7.68	94.90	< 0.20	1.68	3.90	2.28
KTS-1 D	214 227	40.21	8.09	27.77	4.28	3.82	0.77	0.63	0.64	0.15	0.25	0.01	7.73	94.36	< 0.20	1.69	3.94	2.29
KTS-1 E	214 227	40.64	8.27	27.72	4.27	3.91	0.77	0.62	0.64	0.17	0.25	0.01	7.68	94.96	< 0.20	1.65	3.93	2.26
KTS-1 F	214 227	40.77	8.27	27.75	4.32	3.95	0.79	0.62	0.64	0.18	0.25	0.01	8.26	95.82	< 0.20	1.74	3.98	2.22
KTS-2 A	214 227	5.81	1.72	51.80	0.63	0.97	0.41	0.17	0.29	0.08	0.04	0.01	35.07	97.00	< 0.20	18.52	10.00	5.01
KTS-2 B	214 227	5.40	1.61	51.30	0.61	0.75	0.36	0.15	0.28	0.05	0.04	< 0.01	35.06	95.61	< 0.20	18.61	9.85	5.11
KTS-2 C	214 227	5.58	1.61	51.16	0.60	0.93	0.38	0.16	0.27	0.08	0.04	0.01	35.15	96.41	< 0.20	18.36	9.98	5.19
KTS-2 D	214 227	5.55	1.55	50.84	0.60	0.86	0.37	0.16	0.28	0.06	0.03	< 0.01	35.10	95.40	< 0.20	19.24	9.88	5.29
KTS-2 E	214 227	6.21	1.51	50.83	0.60	0.74	0.38	0.15	0.26	0.09	0.03	0.01	35.11	95.92	< 0.20	19.29	9.95	5.14
KTS-2 F	214 227	5.60	1.56	51.09	0.62	0.89	0.39	0.15	0.27	0.08	0.03	0.01	35.12	95.81	< 0.20	19.25	10.03	5.77
KTS-3 A	214 227	32.63	9.33	28.34	3.98	3.20	0.78	0.41	0.52	0.13	0.26	0.01	15.59	95.19	< 0.20	10.32	4.69	5.08
KTS-3 B	214 227	32.64	9.19	28.34	4.01	3.22	0.75	0.41	0.50	0.14	0.26	0.01	15.06	94.54	< 0.20	10.31	4.83	5.02
KTS-3 C	214 227	33.34	9.79	28.40	3.98	3.40	0.83	0.42	0.53	0.14	0.26	0.01	15.13	96.24	< 0.20	10.49	4.65	5.14
KTS-3 D	214 227	32.40	9.12	28.41	3.97	3.19	0.78	0.42	0.50	0.12	0.26	0.01	15.26	94.45	< 0.20	10.18	4.77	5.21
KTS-3 E	214 227	32.44	9.12	28.24	3.98	3.19	0.76	0.42	0.50	0.14	0.25	0.01	15.11	94.17	< 0.20	10.29	4.75	5.19
KTS-3 F	214 227	32.64	9.17	28.44	4.00	3.24	0.77	0.41	0.51	0.15	0.26	0.01	15.03	94.64	< 0.20	10.18	4.76	5.16
KTS-4 A	214 227	1.70	0.69	79.70	0.36	0.64	0.18	0.06	0.15	0.06	0.01	< 0.01	13.71	97.26	not/ss	35.34	1.05	0.69
KTS-4 B	214 227	1.78	0.73	79.61	0.35	0.61	0.17	0.07	0.14	0.05	0.01	< 0.01	13.78	97.30	not/ss	35.07	1.07	0.79
KTS-4 C	214 227	1.74	0.76	80.70	0.37	0.67	0.19	0.06	0.15	0.10	0.01	< 0.01	13.78	98.53	not/ss	35.45	1.05	not/ss
KTS-4 D	214 227	1.69	0.77	79.20	0.36	0.74	0.20	0.06	0.14	0.11	0.01	< 0.01	13.76	97.04	not/ss	35.60	1.17	not/ss
KTS-4 E	214 227	1.76	0.75	79.78	0.36	0.70	0.20	0.06	0.14	0.11	0.01	< 0.01	13.76	97.63	not/ss	35.53	0.95	0.58
KTS-4 F	214 227	1.78	0.80	80.40	0.35	0.77	0.21	0.05	0.14	0.11	0.01	< 0.01	13.70	98.32	not/ss	35.24	0.94	0.61

ALL ASSAY DETERMINATIONS ARE PERFORMED OR SUPERVISED BY BC CERTIFIED ASSAYERS

CERTIFICATION :

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CERTIFICATE OF ANALYSIS A8810059

SAMPLE DESCRIPTION	PREP CODE		Cu ppm	Pb ppm	Zn ppm	Cd ppm	Ni ppm	Co ppm	As ppm	Au ppb AFS	Pd ppb AFS	Pt ppb AFS
RTS-1 A	299	--	604	78	660	0.4	14	14	5	260	< 2	< 5
RTS-1 B	299	--	604	76	670	0.4	14	14	5	260	< 2	< 5
RTS-1 C	299	--	606	78	656	0.4	14	14	5	270	< 2	< 5
RTS-1 D	299	--	600	78	640	0.6	14	14	5	270	< 2	< 5
RTS-1 E	299	--	586	76	650	0.4	14	14	6	280	< 2	< 5
RTS-1 F	299	--	620	78	686	0.6	16	16	3	280	< 2	< 5
RTS-2 A	299	--	670	18	145	0.4	2100	56	5	50	140	210
RTS-2 B	299	--	656	17	144	0.4	2040	56	3	50	150	220
RTS-2 C	299	--	646	16	136	0.4	2060	54	5	46	150	210
RTS-2 D	299	--	660	18	144	0.6	2060	56	4	48	140	220
RTS-2 E	299	--	670	17	135	0.6	2100	54	3	48	150	220
RTS-2 F	299	--	670	17	139	0.6	2100	56	5	48	150	210
RTS-3 A	299	--	2900	124	2000	8.6	68	220	6	260	< 2	< 5
RTS-3 B	299	--	2760	118	1900	7.8	64	210	10	270	< 2	< 5
RTS-3 C	299	--	2700	116	1860	7.8	64	212	4	270	< 2	< 5
RTS-3 D	299	--	2800	116	1860	7.8	64	214	7	270	< 2	< 5
RTS-3 E	299	--	2800	118	1880	8.0	66	220	5	260	< 2	< 5
RTS-3 F	299	--	2860	120	1900	8.4	68	212	6	280	< 2	< 5
RTS-4 A	299	--	260	28	167	0.8	6500	114	160	24	26	70
RTS-4 B	299	--	262	28	170	0.8	6600	122	160	24	28	60
RTS-4 C	299	--	254	28	174	0.8	6400	114	150	22	28	60
RTS-4 D	299	--	260	28	180	0.8	6800	118	160	20	28	60
RTS-4 E	299	--	260	28	178	0.8	6700	116	160	56	22	40
RTS-4 F	299	--	258	26	174	0.6	6500	114	150	24	24	40

CERTIFICATION : DC